



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,184	10/14/2003	Sunoj Koshy	14965US01	4204

7590 10/17/2007
CHRISTOPHER C. WINSLADE
McANDREWS, HELD & MALLOY, LTD.
500 WEST MADISON STREET
34TH FLOOR
CHICAGO, IL 60661

EXAMINER

NEWAY, SAMUEL G

ART UNIT	PAPER NUMBER
----------	--------------

2626

MAIL DATE	DELIVERY MODE
-----------	---------------

10/17/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/685,184	Applicant(s) KOSHY, SUNOJ	
	Examiner Samuel G. Neway	Art Unit 2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 and 21 is/are rejected.
- 7) ☐ Claim(s) 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This is responsive to the Amendment filed on 16 July 2007.
2. Claims 1 – 20 are still pending, claim 21 is new.

Response to Arguments

3. Applicant's arguments with respect to claims 1 – 20 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1 – 19, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsai et al ("Architecture Design for MPEG-2 AAC Filterbank Decoder Using Modified Regressive Method", Acoustics, Speech, and Signal Processing, 2002. Proceedings. (ICASSP '02). IEEE International Conference on Volume 3, 13-17 May 2002 Page(s):III-3216 - III-3219 vol.3) in view of Taruki et al (USPN 6,344,808).

Claim 1:

Tsai discloses a method for calculating pulse code modulated samples, said method comprising:

accessing an IMDCT sample from a previous set of IMDCT samples ("the second half of previous reconstructed 1024 points IMDCT values", p. 3218, section 4, paragraph 3);

accessing an IMDCT sample from a present set of IMDCT samples ("the first half of current reconstructed 1024 points IMDCT values", p. 3218, section 4, paragraph 3);

calculating a first pulse code modulated sample from the accessed IMDCT sample from the previous set of IMDCT samples and the accessed IMDCT sample from the present set of IMDCT samples ("Out_{i,n}", Fig. 7 and related text).

Tsai does not explicitly disclose calculating a second pulse code modulated sample from the accessed IMDCT sample from the previous set of IMDCT samples and the accessed IMDCT sample from the present set of IMDCT samples (Figure 6 and related text).

Taruki, in a similar decoding method, discloses using the symmetries of the IMDCT in order to calculate IMDCT samples (col. 15, lines 22-30).

It would have been obvious to one with ordinary skill in the art at the time of the invention to use the IMDCT symmetries in Tsai method to calculate a second PCM value in order to cut in half the "number of required times of calculation" (Taruki, col. 14, lines 49-51).

From Tsai windowing and overlap-add (or from the well known MPEG-2 standard as admitted by Applicant), we can write using Taruki's notation,

$$H_i(j) = W(j) * Z_i(j) + W(j+N) * Z_{i-1}(j+N)$$

For $N = 12$ (as in Taruki's disclosure), we can write

$$H_i(0) = W(0) * Z_i(0) + W(6)*Z_{i-1}(6)$$

$$H_i(5) = W(5) * Z_i(5) + W(11)*Z_{i-1}(11)$$

Using the symmetries in Taruki (col. 15, lines 22-30), we can write,

$$H_i(0) = W(0) * Z_i(0) + W(6)*Z_{i-1}(6) \quad (\text{equation 1})$$

$$H_i(5) = W(5) * (-Z_i(0)) + W(11)*Z_{i-1}(6) \quad (\text{equation 2})$$

These equations flow inherently from the IMDCT symmetries when applied to the windowing and overlap-adding of the MPEG-2 standard.

Claim 2:

Tsai and Taruki disclose the method of claim 1, wherein calculating the second pulse code modulated sample comprises inverting the accessed IMDCT sample from the present set of IMDCT samples (equation 2 in claim 1 rejection).

Claim 3:

Tsai and Taruki disclose the method of claim 1, further comprising: accessing a first inverse window coefficient; and accessing a second inverse window coefficient (equation 2 in claim 1 rejection).

Claim 4:

Tsai discloses the method of claim 3, wherein calculating the first pulse code modulated sample further comprises: multiplying the accessed IMDCT sample from the previous set of IMDCT samples with the first inverse window coefficient; and multiplying the accessed IMDCT sample from the present set of IMDCT samples with the second inverse window coefficient (equations 1 and 2 in the rejection of claim 1).

Claim 5:

Tsai discloses the method of claim 4, wherein calculating the second pulse code modulated samples further comprises: accessing a third inverse window coefficient; and accessing a fourth inverse window coefficient (equations 1 and 2 in the rejection of claim 1).

Claim 6:

Tsai discloses the method of claim 5, further comprising: multiplying the accessed IMDCT sample from the previous set of IMDCT samples with a third inverse window coefficient; and multiplying the accessed IMDCT sample from the present set of IMDCT samples with a fourth inverse window coefficient (equations 1 and 2 in the rejection of claim 1).

Claim 7:

Tsai discloses a method for calculating pulse code modulated samples, said method comprising:

- a first address register for accessing an IMDCT sample from a previous set of IMDCT samples ("the second half of previous reconstructed 1024 points IMDCT values", p. 3218, section 4, paragraph 3, see also Fig. 8 and related text);

- a second address register for accessing an IMDCT sample from a present set of IMDCT samples ("the first half of current reconstructed 1024 points IMDCT values", p. 3218, section 4, paragraph 3, see also Fig. 8 and related text);

- an arithmetic logic unit for calculating a first pulse code modulated sample from the accessed IMDCT sample from the previous set of IMDCT samples and the accessed IMDCT sample from the present set of IMDCT samples ("Out_{i,n}", Fig. 7 and related text).

Art Unit: 2626

Tsai does not explicitly disclose calculating a second pulse code modulated sample from the accessed IMDCT sample from the previous set of IMDCT samples and the accessed IMDCT sample from the present set of IMDCT samples (Figure 6 and related text).

Taruki, in a similar decoding method, discloses using the symmetries of the IMDCT in order to calculate IMDCT samples (col. 15, lines 22-30).

It would have been obvious to one with ordinary skill in the art at the time of the invention to use the IMDCT symmetries in Tsai method to calculate a second PCM value in order to cut in half the "number of required times of calculation" (Taruki, col. 14, lines 49-51).

Claims 8 – 14:

Claims 8 – 14 are similar in scope and content to claims 2 – 7 and are rejected with the same rationale.

Claim 15:

Tsai discloses a circuit for calculating PCM samples, said circuit comprising:

a processor for executing a plurality of executable instructions (inherent in the MPEG-2 decoder); an instruction memory for storing the plurality of executable instructions, wherein execution of the executable instructions causes:

accessing an IMDCT sample from a previous set of IMDCT samples ("the second half of previous reconstructed 1024 points IMDCT values", p. 3218, section 4, paragraph 3);

accessing an IMDCT sample from a present set of IMDCT samples ("the first half of current reconstructed 1024 points IMDCT values", p. 3218, section 4, paragraph 3);

calculating a first pulse code modulated sample from the accessed IMDCT sample from the previous set of IMDCT samples and the accessed IMDCT sample from the present set of IMDCT samples ("Out_{i,n}", Fig. 7 and related text).

Tsai does not explicitly disclose calculating a second pulse code modulated sample from the accessed IMDCT sample from the previous set of IMDCT samples and the accessed IMDCT sample from the present set of IMDCT samples (Figure 6 and related text).

Taruki, in a similar decoding method, discloses using the symmetries of the IMDCT in order to calculate IMDCT samples (col. 15, lines 22-30).

It would have been obvious to one with ordinary skill in the art at the time of the invention to use the IMDCT symmetries in Tsai method to calculate a second PCM value in order to cut in half the "number of required times of calculation" (Taruki, col. 14, lines 49-51).

Claim 16:

Tsai and Taruki disclose the circuit of claim 15, Tsai further discloses wherein the processor further comprises:

a first address register for referencing a memory location in the first memory, the memory location in the first memory storing the IMDCT sample from the previous set of IMDCT samples (p. 3218, section 4, paragraph 3, see also Fig. 8 and related text); and

a second address register for referencing a memory location in the second memory, the memory location in the second memory storing the IMDCT samples from the present set of IMDCT samples (p. 3218, section 4, paragraph 3, see also Fig. 8 and related text).

Claim 17:

Tsai and Taruki disclose the circuit of claim 16, Tsai further discloses wherein execution of the plurality of instructions further causes: incrementing the first address register; and incrementing the second address register ("access order is from low to high", p. 3218, section 4, paragraph 3, see also Fig. 8 and related text).

Claim 18:

Tsai and Taruki disclose the circuit of claim 17, Tsai further discloses wherein execution of the plurality of instructions further causes: storing the first pulse code modulated sample in a memory location in a third memory; and storing the second pulse code modulated sample in another memory location in the third memory ("Buffer", Fig. 7 and related text).

Claim 19:

Tsai and Taruki disclose the circuit of claim 18, but they do not explicitly disclose wherein the processor further comprises: a third address register for referencing the memory location in the third memory; and a fourth address register for referencing the memory location in the fourth memory.

However, it would have been obvious to one with ordinary skill in the art at the time of the invention to store and retrieve the PCM values as claimed in order to output them using a digital device.

Claim 21:

Tsai and Taruki disclose the method of claim 1, Tsai further discloses wherein said IMDCT samples comprise reconstructed values from application of the Inverse Modified Discrete Cosine Transformation to modified discrete cosine transformation values (page 3217, section 3.1, equation 1).

Allowable Subject Matter

6. Claim 20 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art of record, individually or in combination, does not disclose incrementing and decrementing address registers as claimed in the instant claim.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel G. Neway whose telephone number is 571-270-1058. The examiner can normally be reached on Monday - Friday 8:30AM - 5:30PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R Hudspeth can be reached on 571-272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SN

SN



DAVID HUDSPETH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600